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WAR DEPARTMENT
CORPS OF ENGINEERS
OFFICE OF THE DISTRICT ENGINEER
DETROIT DISTRICT
800 GUARDIAN BUILDING
DETROIT, MICHIGAN

STATISTICAL REPORT

OF

LAKE COMMERCE PASSING THROUGH CANALS AT SAULT STE. MARIE

MICHIGAN AND ONTARIO

DURING

Season of 1945

Statistics in this Report are based upon preliminary information furnished by masters of vessels when passing through the locks. For corrected statistics see the Annual Report of the Chief of Engineers for the fiscal year 1946.

PREPARED UNDER DIRECTION OF
COLONEL A. RIANI
CORPS OF ENGINEERS, U.S. ARMY

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STATISTICS OF LAKE COMMERCE

passing through

THE AMERICAN AND CANADIAN CANALS

at

SAULT STE. MARIE, MICHIGAN AND ONTARIO

DURING THE SEASON OF 1945

(Compiled from official records at St. Marys Falls Canal, Mich.)

[1] GENERAL DATA

SOURCES OF INFORMATION FOR TRAFFIC DATA.--The compilation was done by the clerical force of the United States canal office at Sault Ste. Marie, Mich., under the supervision of J. E. Harns, Engineer-in-Charge.

FREIGHT TONNAGE AND PASSENGERS.--The freight unit used and designated as a "ton" means in every instance a ton of 2,000 pounds. The data relative to freight and passengers were compiled from reports made by vessel masters when passing through the American and Canadian canals. As a daily exchange of these reports is made with the Canadian canal, both offices have record of the entire lake traffic to and from Lake Superior.

REGISTERED TONNAGE.--The term "registered tonnage" as used in this report means the net tonnage of the vessel, which is the cubical capacity in tons of 100 cubic feet each, available for cargo and passengers, and is obtained from vessel papers.

General merchandise covers all items not otherwise classified, including such commodities as package freight, cement, wool, etc.; prior to 1916 also included are petroleum products, broken stone, sand, and gravel and prior to 1937 automobiles are reported. "Stone" represented building stone alone prior to 1916; it now includes broken stone, gravel, and sand.

[1] For information prior to the season of 1941 see Statistical Report for the Season of 1940.

THE AMERICAN AND CANADIAN CANALS.--The total freight traffic of 113,276,450 tons for the season of 1945, when compared with the season of 1944, shows a decrease of 3,961,581 tons or 3 percent; and the net registered tonnage of 86,932,007 tons a decrease of 1,007,131 tons or 1 percent.

The freight items of pulpwood, flour, wheat, grain, other than wheat, scrap iron, hard coal, salt, stone, petroleum products, and automobiles showed an increase; and all other items showed a decrease when compared with the season of 1944.

The total number of passengers was 46,044, a decrease of 1,622 or 3 percent.

The total passages through canals numbered 22,408, a decrease of 1,095 or 5 percent.

The total lockages numbered 17,174, a decrease of 327 or 2 percent.

The season of navigation covered a period of 266 days, during which time the average monthly freight traffic was 12,775,539 tons and the net registered tonnage 9,804,362.

The draft of down-bound vessels was limited by the depths available at the docks of destination and load line regulations promulgated by the Department of Commerce. At the opening of navigation the draft recommended by the Lake Carriers' Association for up-bound vessels, St. Marys River, was 19 feet 6 inches. Changes during the navigation season were as follows: April 13, 19 feet 9 inches; April 27, 20 feet 0 inches; June 9, 20 feet 3 inches; June 20, 20 feet 6 inches; July 28, 20 feet 9 inches; and for down-bound vessels 22 feet at the opening of navigation, with the following changes; April 13, 23 feet 2 inches; April 27, 24 feet 0 inches; June 9, 24 feet 3 inches; June 20, 24 feet 6 inches; September 28, 23 feet 6 inches; November 9, 22 feet 6 inches.

THE AMERICAN CANAL.--The traffic through the American canal was 98 percent of the total freight, 95 percent of the total registered tonnage, and 15 percent of the total passengers carried; the amounts being 111,258,430 tons of freight, 82,724,931 tons register, and 6,797 passengers. Compared with the season of 1944, there was a decrease of 3,167,776 tons of freight or 3 percent, an increase of 918,662 tons register or 1 percent, and an increase of 6,742 passengers.

The American records showed that vessels necessarily spent 19,543 hours and 55 minutes in the canal, or an average of 65 minutes, which included waiting for lockage and passage through locks and canal, the latter being 1 3/4 miles long.

Other delays at the canal, which included vessel repairs and waiting for favorable weather amounted to 312 hours and 21 minutes.

Locomotives and trains were delayed 156 hours and 22 minutes by passing boats, temporarily preventing the closing of the draw-bridges.

During the period of navigation the swing bridge over the south canal, leading to the MacArthur and Poe Locks, was closed 596 hours and 59 minutes.

The bascule bridge over the north canal, leading to the Davis and Sabin Locks, was closed 521 hours and 1 minute.

During this time 1,574 locomotives, 3,404 passengers, and 21,719 freight cars crossed the International Railway bridge.

The American canal opened March 25 and closed December 15, 1945; total time in operation during the season, 266 days.

THE CANADIAN CANAL.--The traffic through the Canadian canal was 2 percent of the total freight, 5 percent of the total registered tonnage, and 85 percent of the total passengers carried; the amounts being 2,018,020 tons of freight, 4,207,076 tons register, and 39,247 passengers. Compared with the season of 1944, there was a decrease of 793,805 tons of freight or 28 percent, 1,925,793 tons net register or 31 percent, and 8,364 passengers or 18 percent.

GENERAL SUMMARY FOR AMERICAN AND CANADIAN CANALS.--

Total tons, net register		86,932,007
Total valuation of registered vessels	dollars	253,362,610
Total freight carried	tons	113,276,450
Average distance freight carried	miles	800
Total mile-tons		90,625,549,842
Time Canadian canal operated	days	247
Time American canal operated	days	266
Average cost per lockage, American canal	dollars	45.35
Average cost per passage, American canal	dollars	34.97
Total number of registered vessels which used canal		640
Freight carried by -		
Registered vessels	tons	113,276,450
American vessels	percent	87
Canadian vessels	percent	13
Total number of passengers carried		46,044
Percentage of passengers carried by -		
American vessels	percent	29
Canadian vessels	percent	71

TABLE OF WEIGHTS AND MEASURES.--

Barley, 1 bushel. . .	48 lbs.	Wood:	
Corn, 1 bushel. . . .	56 lbs.	Dry Lumber, M ft. b.m. . .	1-1/2 tons
Flaxseed, 1 bushel. .	56 lbs.	Green lumber, M ft. b.m. . . .	2 tons
Oats:		Pulpwood, 1 cord, M ft. b.m. . .	2 tons
American (1 bushel).	32 lbs.	Shingles, 10 M.	1 ton
Canadian (1 bushel).	34 lbs.	Petroleum products:	
Rye, 1 bushel	56 lbs.	Lubricating, 5 barrels. . . .	1 ton
Wheat, 1 bushel . . .	60 lbs.	Kerosene, 303 gallons	1 ton
Flour, 10 barrels . .	1 ton	Gasoline, 303 gallons	1 ton
Automobiles, each .	1-3/4 tons	Fuel, 270 gallons	1 ton

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[1] FREIGHT TRAFFIC

EAST- AND WEST-BOUND TRAFFIC

East- and west-bound commerce passing both American and Canadian Canals at Sault Ste. Marie, Michigan and Ontario, for the season of 1945

(Part I of two parts)	EAST-BOUND		
Items	U.S. Canal	Canadian Canal	Total
Vessel passages. . .(number).	10,211	1,000	11,211
Registered tonnage . . .(net). .	42,336,432	1,158,504	43,494,936
Passengers . .(number). .	2,827	19,868	22,695
Freight. . . .(short tons)	95,629,490	1,430,329	97,059,819
Wood products:			
Lumber.	3,166	0	3,166
Shingles.	0	0	0
Pulpwood.	529,830	77,676	607,506
Vegetable products:			
Flour	36,073	72,257	108,330
Wheat	13,863,539	590,561	14,454,100
Grain, other than wheat	2,677,042	459,181	3,136,223
Mineral products:			
Copper, lake. . . .	0	0	0
Copper, electrolytic. . .	0	0	0
Zinc.	0	0	0
Iron ore.	78,039,957	0	78,039,957
Scrap iron.	151,368	0	151,368
M'f'd iron & steel.	118,732	10,781	129,513
Stone* . . .	4,900	12,210	17,110
General merchandise. . .	204,883	207,663	412,546

[1] For information prior to the season of 1941 see Statistical Report for the Season of 1940.

(East- and West-bound traffic, continued)

(Part II of two parts)			
	WEST-BOUND		
Vessel passages. . .(number).	9,603	1,594	11,197
Registered tonnage . . .(net).	40,388,499	3,048,572	43,437,071
Passengers . .(number).	3,970	19,379	23,349
Freight. . . .(short tons) .	15,628,940	587,691	16,216,631
Mineral products:			
Coal, soft. .	13,196,767	113,966	13,310,733
Coal, hard. .	523,339	8,818	532,157
Iron ore. . .	87,207	600	87,807
M'f'd iron & steel	35,668	9,664	45,332
Salt.	55,951	11,631	67,582
Stone*. . . .	903,611	8,680	912,291
Petroleum products. .	685,251	153,683	838,934
Wood products:			
Pulpwood. . .	500	380	880
General merchandise .	140,187	279,010	419,197
Automobiles	459	1,259	1,718
	SUMMARY		
Vessel passages. ...(number).	19,814	2,594	22,408
Registered tonnage . . .(net).	82,724,931	4,207,076	86,932,007
Passengers .z.(number).	6,797	39,247	46,044
Freight. . . .(short tons)	111,258,430	2,018,020	113,276,450

*Includes broken stone and gravel and sand.

COMPARATIVE TRAFFIC, YEARS 1944 AND 1945

Lake commerce through the canals at Sault Ste. Marie, Michigan and Ontario, for the seasons of 1944 and 1945.

(Section I of two sections)

Items	Total traffic for		Increase or decrease		
	Season 1944	Season 1945	Amount	Percent Increase	Percent Decrease
Vessel passages. . .(number).	23,503	22,408	1,095		5
Propellers.(number).	21,081	20,268	813		4
Barges, etc(number).	883	849	34		4
Unregistered(number).	1,539	11,291	248		16

(Section II of two sections)

Items	Total traffic for		Increase or decrease		
				Percent	
	Season 1944	Season 1945	Amount	in-crease	de-crease
Registered tonnage. . .(net).	87,939,138	86,932,007	1,007,131		1
Lockages. . .(number).	17,801	17,474	327		2
Passengers. .(number).	47,666	46,044	1,622		3
Freight . . .(short tons) .	117,238,031	113,276,450	3,961,581		3
Wood products:					
Pulpwood . . .	431,602	608,386	176,784	41	
Lumber	0	3,166	3,166		
Shingles . . .	0	0	0	-	-
Vegetable products					
Flour.	100,979	108,330	7,351	7	
Wheat.	12,226,567	14,454,100	2,227,533	18	
Grain, other than wheat. .	2,505,508	3,136,223	630,715	25	
Mineral products					
Copper, lake .	0	0	0	-	-
Copper, electrolytic.	0	0	0	-	-
Zinc	0	0	0	-	-
Iron ore . . .	82,806,592	78,127,764	4,678,828		6
M'f'd iron & steel	235,597	174,845	60,752		26
Scrap iron . .	81,033	151,368	70,335	87	
Coal, soft . .	16,030,512	13,310,733	2,719,779		17
Coal, hard . .	401,746	532,157	130,411	32	
Salt	57,579	67,582	10,003	17	
Stone*	724,122	929,401	205,279	28	
Petroleum products . .	770,454	838,934	68,480	9	
General merchandise. .	864,338	831,743	32,595		4
Automobiles.	1,402	1,718	316	23	

MONTHLY REGISTERED AND FREIGHT TONNAGE, SEASON 1945

Month	Net registered tonnage of vessels			Freight carried		
	East-bound	West-bound	Total	East-bound	West-bound	Total
				Tons	Tons	Tons
March	5,454	9,794	15,248	10,800	-	10,800
April	4,104,879	4,776,908	8,881,787	8,735,617	1,044,311	9,779,928
May	5,899,701	5,828,020	11,727,721	13,558,782	1,988,750	15,547,532
June	5,789,943	5,791,768	11,581,711	13,308,661	2,159,117	15,467,778
July	6,065,529	6,004,170	12,069,699	13,948,599	2,000,138	15,948,737
August	5,809,990	5,879,597	11,689,587	13,321,286	2,072,844	15,394,130
September	5,688,673	5,668,506	11,357,179	13,015,562	2,388,408	15,403,970
October	5,985,975	5,962,339	11,948,314	12,841,305	1,879,374	14,720,679
November	3,662,419	3,363,078	7,025,497	7,368,639	2,624,677	9,993,316
December	482,373	152,891	635,264	950,568	59,012	1,009,580
Total	43,494,936	43,437,071	86,932,007	97,059,819	16,216,631	113,276,450

INTERLAKE TRAFFIC

Freight between Lake Superior and each of the other lakes, classified with reference to American and Canadian vessels, season of 1945.

Freight carried by -	Ports		East-bound from Lake Superior to -				Total
	From	To	Lake Michigan	Lake Huron	Lake Erie	Lake Ontario	
			Tons	Tons	Tons	Tons	
American vessels . . .	American	American	19,376,378	10,021	61,659,343	619,005	81,664,747
Do.	do	Canadian	---	15,168	---	---	15,168
Do.	Canadian	American	282,872	---	3,385,331	---	3,668,203
Do.	do	Canadian	---	682,995	178,052	72,382	933,429
Canadian vessels . . .	Canadian	Canadian	---	5,410,301	1,275,556	1,992,066	8,677,923
Do.	do	American	364,171	7,202	581,622	2,832	955,827
Do.	American	Canadian	---	2,608	112,412	1,006,094	1,121,114
Do.	do	American	---	---	23,408	---	23,408
Total east-bound			20,023,421	6,128,295	67,215,724	3,692,379	97,059,819

Freight carried by -	Ports		West-bound to Lake Superior from -				Total
	From	To	Lake Michigan	Lake Huron	Lake Erie	Lake Ontario	
			Tons	Tons	Tons	Tons	
American vessels . . .	American	American	708,006	602,206	10,406,382	48,900	11,765,494
Do.	do	Canadian	357,753	278,220	431,487	---	1,067,460
Canadian vessels . . .	Canadian	do	---	387,074	19,901	215,871	622,846
Do.	do	American	---	31	---	4,385	4,416
Do.	American	Canadian	197,416	---	2,558,999	---	2,756,415
Total west-bound			1,263,175	1,267,531	13,416,769	269,156	16,216,631
Grand total			21,286,596	7,395,826	80,632,493	3,961,535	113,276,450

PERCENTAGE OF FREIGHT CARRIED BY AMERICAN, CANADIAN, AND OTHER FOREIGN VESSELS

Year	Freight carried by -		Origin of freight	
	American vessels	Canadian and other foreign vessels	American	Canadian
	Percent	Percent	Percent	Percent
1941	88	12	91	9
1942	88	12	93	7
1943	89	11	91	9
1944	89	11	89	11
1945	87	13	87	13

STATEMENT OF COMMERCE THROUGH BOTH AMERICAN AND CANADIAN CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, 1941 - 1945

Year	Date of opening canal	Date of closing canal	Class and tonnage of vessels					Passenger and freight traffic			
			Passage by -			Total passages	Net registered tonnage	Passengers	Coal	Flour	Wheat
			Propellers	Other registered craft	Unregistered craft				Tons	Barrels	Bushels
1941	Apr. 1	Dec. 15	23,786	1,151	928	25,865	89,046,612	89,824	12,309,058	6,628,980	296,878,862
1942	Mar. 22	Dec. 17	24,198	1,434	1,252	26,884	93,632,469	42,845	13,210,834	3,091,710	225,591,117
1943	Apr. 19	Dec. 15	22,037	1,383	1,531	24,951	86,598,973	40,292	15,881,954	1,262,680	288,480,417
										Tons	Tons
1944	Mar. 31	Jan. 14, 1945	21,081	883	1,539	23,503	89,938,138	47,666	16,432,258	100,979	12,226,567
1945	Mar. 25	Dec. 15	20,268	849	1,291	22,408	86,932,007	46,044	13,842,890	108,330	14,454,100

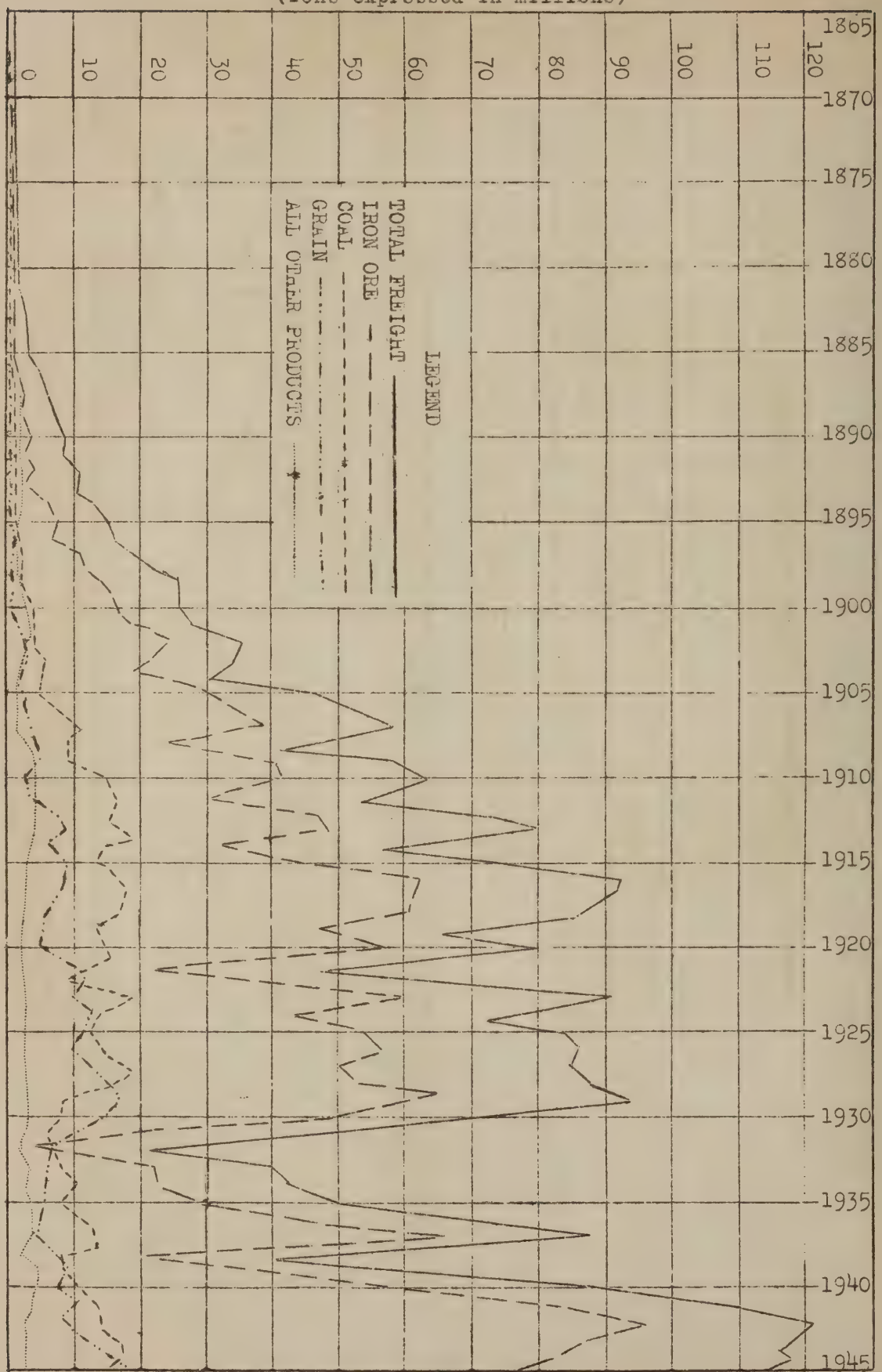
(continued)

STATEMENT OF COMMERCE THROUGH BOTH AMERICAN AND CANADIAN CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO, 1941-1945

Grain (other than wheat)	Structural steel & scrap iron	Salt	Copper and zinc	Iron ore	Wood products	Petroleum products	Stone	General merchandise	Automobiles	Total freight	Year
Bushels	Tons	Tons	Tons	Tons	M ft. b.m.	Tons	Tons	Tons	No.	Tons	
61,616,382	531,922	50,406	39,168	83,151,024	398,390	1,014,215	871,921	1,196,786	28,148	111,121,684	1941
55,643,263	415,929	46,280	22,758	94,326,578	400,342	773,915	1,229,784	972,350	541	120,199,479	1942
97,926,886	346,712	59,224	--	85,583,376	293,858	814,967	1,023,608	583,191	325	115,851,903	1943
Tons					Tons				Tons		
2,505,508	316,630	57,579	--	82,806,592	431,602	770,454	724,122	864,338	1,402	117,238,031	1944
3,136,223	326,213	67,582	--	78,127,764	611,552	838,934	929,401	831,743	1,718	113,276,450	1945

EAST- AND WEST-BOUND FREIGHT, 1941-1945

Year	West-bound	East-bound	Total
	Tons	Tons	Tons
1941	15,108,346	96,013,338	111,121,684
1942	15,954,849	104,244,630	120,199,479
1943	18,198,812	97,653,091	115,851,903
1944	18,521,736	98,716,295	117,238,031
1945	16,216,631	97,059,819	113,276,450



FREIGHT TRAFFIC THROUGH AMERICAN AND CANADIAN CANALS AT SAULT STE. MARIE, MICHIGAN AND ONTARIO

(1) VESSEL DATA

VESSEL CLASSIFICATION, SHOWING VALUATION, PASSAGES, AND REGISTERED TONNAGE DURING THE SEASON OF 1945.

American vessels

Class	Number of registered vessels	Valuation	Passages	Tonnage		Passengers
				Registered	Freight	
Steamers . .	344	$185,745,415	15,688	1,569,613	96,924,987	12,974
Motor vessels	64	13,585,480	316	92,211	990,924	5
Barges . . .	26	4,946,800	359	43,671	1,198,590	0
Unregistered	--	--	1,230	--	--	248
Total . .	434	204,277,695	17,593	1,705,495	99,114,501	13,227

Canadian vessels

Steamers . .	151	40,911,511	3,964	289,704	12,881,859	32,739
Motor vessels	23	2,408,820	300	14,623	79,771	63
Barges . . .	32	5,764,584	490	51,956	1,200,319	0
Unregistered	--	--	61	--	--	15
Total	206	49,084,915	4,815	356,283	14,161,949	32,817
Grand Total	640	253,362,610	22,408*	2,061,778	113,276,450	46,044

*Of the 22,408 passages for the season, 1,511 were made by 45 vessels under 100 tons register, with an average register of 30 tons. The total freight carried by such craft amounted to 1,241 tons.

(1) For information prior to season of 1941 see Statistical Report of Season 1940.

DIMENSIONS OF VESSELS, AVERAGE AND MAXIMUM, AND PERCENTAGE OF TOTAL FREIGHT CARRIED

Class	Passages of vessels of class	Aggregate freight carried by vessels of class	Average cargo per loaded passage	Percentage of total freight carried by class	Registered vessels which used canal	Aggregate registered tonnage	Average registered tonnage	Average length	Maximum length	Maximum beam
Tons net register Between -	Number	Tons	Tons		Number	Tons	Tons	Feet	Feet	Feet
1 and 1,000	2,243	249,824	925	0	119	38,270	322	123	264	57.0
1,000 and 2,000	1,339	2,168,212	2,334	2	93	119,700	1,287	252	356	50.0
2,000 and 3,000	2,191	7,420,787	5,244	6	94	239,440	2,547	371	474	60.3
3,000 and 4,000	3,512	16,761,822	7,294	15	90	309,098	3,434	441	526	56.2
4,000 and 5,000	3,409	21,016,775	10,070	19	77	356,308	4,627	520	602	60.2
5,000 and 6,000	3,497	23,784,950	11,982	21	79	430,439	5,449	558	605	60.3
6,000 and 7,000	4,704	39,521,366	15,171	35	83	531,467	6,403	609	640	67.0
7,000 and over	222	2,352,714	16,338	2	5	37,056	7,411	628	639	70.2
Unregistered	1,291	0	--	0	--	--	--	--	--	--
Total	22,408	113,276,450	--	100	640	2,061,778	--	--	--	--

DIMENSIONS OF REGISTERED VESSELS AVERAGE, AND LIMITING, CLASSIFIED BY MAXIMUM FREIGHT CARGOES

Freight-tons in largest cargo	Number of vessels	Length			Beam			Actual draft		
		Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum	Average
No cargoes. . . .	146	328	30	162	57.0	7.0	31.0	17.0	3.0	10.1
Less than 100 . .	3	94	74	82	30.0	18.0	24.0	8.6	5.0	6.4
100 to 1,000. . .	3	193	116	165	40.1	29.1	33.6	15.6	6.0	10.8
1,000 to 2,000. .	12	365	176	281	50.0	29.8	39.4	18.0	10.4	14.7
2,000 to 3,000. .	27	385	250	263	52.0	36.9	42.5	18.6	12.5	16.1
3,000 to 4,000. .	56	350	250	269	57.5	38.6	43.5	20.6	14.0	16.7
4,000 to 5,000. .	11	494	248	377	56.0	40.2	47.3	20.5	16.7	18.7
5,000 to 6,000. .	18	530	345	401	56.0	42.3	47.1	21.1	16.9	19.2
6,000 to 7,000. .	33	531	364	398	56.2	44.0	48.3	21.9	17.4	20.3
7,000 to 8,000. .	40	524	376	432	56.0	47.9	50.4	21.8	18.0	20.7
8,000 to 9,000. .	51	524	430	454	60.3	50.0	51.6	21.9	19.8	20.7
9,000 to 10,000 .	18	552	460	490	56.2	50.2	52.4	21.8	19.6	20.9
10,000 to 11,000.	24	565	464	505	56.2	52.0	53.7	22.4	20.8	21.6
11,000 to 12,000.	44	639	524	536	65.2	50.1	55.0	22.5	19.6	21.4
12,000 to 13,000.	37	569	524	552	60.2	54.0	56.5	22.6	20.9	21.8
13,000 to 14,000.	17	607	545	565	60.2	56.0	58.0	22.6	21.6	21.9
14,000 to 15,000.	22	607	600	601	60.2	58.0	58.5	23.2	21.6	22.1
15,000 to 16,000.	46	621	600	604	62.2	58.0	60.2	23.1	22.0	22.6
16,000 to 17,000.	7	625	600	614	64.2	59.2	61.4	23.0	22.3	22.7
17,000 to 18,000.	13	633	612	621	70.2	60.0	61.3	24.9	21.8	24.4
18,000 to 19,000.	7	631	620	622	65.2	60.0	61.4	25.2	23.1	24.5
19,000 to 20,000.	0	--	--	--	--	--	--	--	--	--
20,000 and over .	5	640	640	640	67.0	67.0	67.0	25.1	24.8	24.9

VESSEL DIMENSIONS AS TO LENGTH AND BEAM

Year	Nonfreight carriers (tugs, yachts, etc.)					Freight carriers							Total number
	30 to 99 length, 8 to 60 beam	100 to 199 length, 12 to 58 beam	200 to 299 length, 26 to 62 beam	300 to 399 length, 42 to 96 beam	400 to 499 length, 45 to 98 beam	27 to 99 length, 8 to 54 beam	100 to 199 length, 15 to 45 beam	200 to 299 length, 26 to 50 beam	300 to 399 length, 38 to 57 beam	400 to 499 length, 42 to 60 beam	500 to 599 length, 50 to 60 beam	600 and over length, 58 to 70 beam	
	Number of vessels					Number of vessels							
1941	73	49	7	2	0	4	10	133	77	142	120	83	700
1942	55	60	6	2	0	8	16	101	75	146	124	89	682
1943	49	87	20	15	0	6	5	119	64	143	125	106	739
1944	42	62	19	32	0	6	7	98	58	142	127	104	697
1945	44	61	11	30	0	3	4	87	49	121	125	105	640

YEARLY STATEMENT OF FREIGHT CARRIED BY PROPELLERS AND OTHER VESSELS

Year	Propellers		Sailing and unrigged craft		Unregistered craft carrying freight		Total freight	Percentage of freight carried by propellers
	Number in commission	Freight carried	Number in commission	Freight carried	Number in commission	Freight carried		
1941	639	108,538,851	61	2,582,721	2	112	111,121,684	98
1942	612	117,323,847	70	2,874,828	4	804	120,199,479	98
1943	671	113,446,715	68	2,405,178	2	10	115,851,903	98
1944	646	114,941,018	51	2,297,011	1	2	117,238,031	98
1945	582	110,877,541	58	2,398,909	0	0	113,276,450	98

YEARLY CHANGES IN CLASS OF VESSELS LISTED FROM MAXIMUM FREIGHT CARGOES

Number of propellers

Year	Tons in maximum cargo between -															
	0 and 1,000	1,000 and 2,000	2,000 and 3,000	3,000 and 4,000	4,000 and 5,000	5,000 and 6,000	6,000 and 7,000	7,000 and 8,000	8,000 and 10,000	10,000 and 12,000	12,000 and 14,000	14,000 and 16,000	16,000 and 18,000	18,000 and 20,000	20,000 and over	Total
1941	125	16	53	67	13	18	34	51	66	67	47	71	10	1	--	639
1942	113	8	39	58	13	11	32	50	76	66	58	71	9	8	--	612
1943	140	15	53	58	10	12	28	46	82	64	60	63	34	2	4	671
1944	144	11	32	58	9	20	29	51	70	65	56	67	26	2	6	646
1945	121	10	27	52	8	11	28	39	64	68	54	68	20	7	5	582

Number of sailing and unrigged craft

1941	25	--	4	6	3	10	7	1	5	--	--	--	--	--	--	61
1942	33	5	--	8	3	8	6	1	6	--	--	--	--	--	--	70
1943	41	2	--	2	3	6	6	2	6	--	--	--	--	--	--	68
1944	21	2	2	3	3	7	6	1	6	--	--	--	--	--	--	51
1945	31	2	--	4	3	7	5	1	5	--	--	--	--	--	--	58

Propellers and sailing and unrigged craft combined

1941	150	16	57	73	16	28	41	52	71	67	47	71	10	1	--	700
1942	146	13	39	66	16	19	38	51	82	66	58	71	9	8	--	682
1943	181	17	53	60	13	18	34	48	88	64	60	63	34	2	4	739
1944	165	13	34	61	12	27	35	52	76	65	56	67	26	2	6	697
1945	152	12	27	56	11	18	33	40	69	68	54	68	20	7	5	640

(1) LOCKAGE DATA

GENERAL STATISTICS

Section I of two sections

Year	MacArthur Lock (Opened July 11, 1943)				Poe Lock (Opened Aug. 3, 1896)				Davis Lock (Opened Oct. 21, 1914)			
	Number of lockages	Average time of lockage	Number of passages	Average time passing lock	Number of lockages	Average time of lockage	Number of passages	Average time passing lock	Number of lockages	Average time of lockage	Number of passages	Average time passing lock
		M. s.		M. s.		M. s.		M. s.		M. s.		M. s.
1941	--	--	--	--	4,971	22 29	6,033	22 04	4,647	39 42	7,378	35 19
1942	--	--	--	--	3,254	23 04	3,918	22 34	5,070	41 50	8,706	36 22
1943	1,785	24 12	1,994	23 42	3,054	21 53	3,963	21 54	4,285	39 00	6,903	34 36
1944	3,539	25 20	3,691	24 31	3,020	21 26	3,398	21 18	4,200	36 11	6,276	33 27
1945	3,772	24 29	3,890	24 17	3,301	21 25	3,716	21 08	4,229	34 45	6,105	32 02

Section II of two sections

Year	Sabin Lock (Opened Sept. 18,11919)				All Locks				Average time of passage of canal 1-3/4 miles long, including lockage	
	Number of lockages	Average time of lockage	Number of passages	Average time passing lock	Number of lockages	Average time of lockage	Number of passages	Average time passing lock	Actual	Necessary
		M. s.		M. s.		M. s.		M. s.	H. m.	H. m.
1941	4,642	42 14	7,609	37 22	14,260	34 31	21,020	32 15	1 21	1 18
1942	4,993	44 10	8,908	38 11	13,317	38 08	21,532	34 36	1 34	1 31
1943	4,303	42 01	7,352	36 32	13,427	34 07	20,302	31 45	1 24	1 21
1944	4,166	38 32	6,669	34 47	14,925	31 59	20,034	30 52	1 15	1 12
1945	3,977	37 13	6,103	33 47	15,279	29 59	19,814	29 00	1 06	1 05

(1) For information prior to the season of 1941 see Statistical Report for the Season of 1940.

TRAFFIC THROUGH EACH LOCK, SEASON OF 1945

Lock	Days operated	Average Daily passages	Registered tonnage	Freight tonnage
	Number	Number	Percent	Percent
MacArthur	231	17	22	37
Poe	203	18	16	1
Davis	259	24	30	28
Sabin	262	23	27	32
Canadian	247	11	5	2
All locks	266	84	100	100

MAXIMUM RECORDS FOR ONE DAY, SEASON OF 1945

Freight Tonnage

Lock	Date	Number of lockages	Number of passages	Registered tonnage	Freight tonnage
MacArthur	7 Aug.	22	23	117,929	283,026
Poe	8 Nov.	20	21	75,331	37,433
Davis	8 Nov.	16	32	130,353	260,320
Sabin	8 Nov.	16	31	143,417	269,160
Canadian	8 Nov.	18	28	54,156	66,907
All locks	8 Nov.	92	134	523,422	895,876
		Passages			
MacArthur	23 June	23	27	117,000	239,928
Poe	31 May	29	35	92,592	2,750
Davis	24 May	21	40	101,579	126,659
Sabin	20 June	22	39	135,874	192,761
Canadian	8 Nov.	18	28	54,156	66,907
All locks	8 Nov.	92	134	523,422	895,876
		Lockages			
MacArthur	23 May	24	26	117,090	282,812
Poe	31 May	29	35	92,592	2,750
Davis	9 June	25	37	147,956	123,370
Sabin	13 Apr.	24	34	163,194	175,545
Canadian	26 Apr.	22	25	41,298	27,388

MAXIMUM ALL-TIME RECORDS FOR 1 DAY

Freight Tonnage

Lock	Date	Number of lockages	Number of passages	Registered tonnage	Freight tonnage
Weitzel (1)	Sept 9, 1895	31	98	85,192	105,542
MacArthur	June 6, 1944	22	22	127,062	308,651
Poe	Sept 2, 1907	28	49	160,179	295,542
Davis	July 28, 1919	25	51	214,117	463,482
Sabin	July 6, 1943	23	45	196,537	451,574
Canadian	June 2, 1913	33	43	154,739	291,983
All locks	July 6, 1943	102	160	600,212	971,427
		Passages			
Weitzel (1)	June 17, 1895	36	119	103,870	84,244
MacArthur	Nov 3, 1943	19	28	70,985	103,580
Poe	May 19, 1899	25	98	117,737	166,825
Davis	May 29, 1942	27	65	181,125	256,133
Sabin	May 29, 1942	25	58	198,450	318,260
Canadian	June 6, 1902	28	81	108,622	117,353
All locks	July 5, 1917	88	161	448,117	492,380
		Lockages			
Weitzel (1)	July 19, 1895	41	100	79,197	58,897
MacArthur	May 23, 1945	24	26	117,090	282,812
Poe	July 19, 1915	38	64	103,537	16,709
Davis	July 9, 1916	31	46	185,664	257,546
Sabin	May 22, 1943	27	51	195,134	261,892
Canadian	June 6, 1910	39	39	143,526	253,347

(1) Weitzel Lock destroyed and replaced by MacArthur Lock 1943.

MAXIMUM ALL-TIME FREIGHT RECORDS FOR EACH MONTH OF NAVIGATION

Month	Year	Number of lockages	Number of passages	Registered tonnage	Freight tonnage
March	1942	141	199	829,421	513,559
April	1942	1,667	2,452	8,771,455	10,216,001
May	1944	2,332	3,234	12,262,914	16,383,301
June	1944	2,471	3,231	12,264,366	17,043,776
July	1944	2,594	3,278	12,853,854	17,449,435
August	1943	2,518	3,586	12,759,182	17,619,709
September	1943	2,505	3,533	12,207,424	16,936,048
October	1943	2,520	3,435	12,276,065	16,502,946
November	1941	1,965	2,623	9,812,801	12,222,942
December	1916	514	760	1,802,349	2,762,375

MAXIMUM CARGOES OF FREIGHT VESSELS, 1941-1945

Year	Largest single cargo		Greatest amount of freight carried	
	Vessel	Tons	Vessel	Tons
1941	Harry Coulby	18,295	Fred G. Hartwell	629,072
1942	Lemoyne	19,132	Fred G. Hartwell	644,004
1943	Benjamin F. Fairless	20,384	Leon Fraser	666,400
1944	Irving S. Olds	20,272	Irving S. Olds	736,828
1945	Benjamin F. Fairless	20,824	Fred G. Hartwell	683,781

TRAFFIC THROUGH AMERICAN AND CANADIAN LOCKS, 1941-1945

Poe Lock (Opened Aug. 3, 1896)

(Section I of two sections)

Year	Passages	Lockages	Registered tonnage	Freight tonnage	Passengers
1941	6,033	4,971	19,064,508	1,151,495	25,098
1942	3,918	3,254	11,865,027	384,146	110
1943	3,963	3,054	10,292,917	2,125,782	0
1944	3,398	3,020	12,567,107	1,062,753	5
1945	3,716	3,301	13,618,882	906,362	1,271

Davis Lock (Opened Oct. 21, 1914)

(Section II of two sections)

Year	Passages	Lockages	Registered tonnage	Freight tonnage	Passengers
1941	7,378	4,647	31,901,784	51,185,209	2,591
1942	8,706	5,070	36,119,859	57,395,936	233
1943	6,993	4,285	30,249,618	48,262,548	0
1944	6,276	4,200	26,158,764	34,701,967	27
1945	6,105	4,229	26,227,895	32,161,777	3,725

Sabin Lock (Opened Sept. 18, 1919)

1941	7,609	4,642	31,011,477	56,013,034	4,268
1942	8,908	4,993	34,797,287	59,383,265	186
1943	7,352	4,303	30,339,906	53,049,470	0
1944	6,669	4,166	24,958,935	38,861,236	23
1945	6,103	3,977	23,627,034	36,112,187	1,622

MacArthur Lock (Opened July 11, 1943)

1943	1,994	1,785	7,589,112	7,844,505	0
1944	3,691	3,539	18,121,463	39,800,250	0
1945	3,890	3,772	19,251,120	42,078,104	179

Combined American Locks

1941	21,020	14,260	81,977,769	108,349,738	31,957
1942	21,532	13,317	82,782,173	117,163,347	529
1943	20,302	13,427	78,471,563	111,282,305	0
1944	20,034	14,925	81,806,269	114,426,206	55
1945	19,814	15,279	82,724,931	111,258,430	6,797

Canadian Lock (Opened Sept. 9, 1895)

1941	4,845	3,610	7,068,843	2,771,946	57,867
1942	5,352	4,089	10,850,296	3,036,132	42,316
1943	4,649	3,554	8,127,410	4,569,598	40,292
1944	3,469	2,876	6,132,869	2,811,825	47,611
1945	2,594	2,195	4,207,076	2,018,020	39,247

COSTS

Original cost, improvement and re-construction cost, and total cost to date are as follows:

Project	Original Cost	Improvement and re-construction	Total
Locks and canal of 1855	$ 999,802	---	$ 999,802
Weitzel Lock	983,335	$ 11,537	994,872
MacArthur Lock	12,415,593(1)	---	12,415,593(1)
Poe Lock	2,837,337	652,362	3,489,699
Davis Lock	2,278,000	293,587	2,571,587
Sabin Lock	2,402,700	45,874	2,448,574
South Canal	3,818,456	---	3,818,456
North Canal	3,300,654	---	3,300,654
Emergency dams	563,832	---	563,832
United States Power House	341,000	592,571	933,571
General (piers, grounds, etc.)	---	881,382	881,382
Total	29,940,709	2,477,313	32,418,022
Canadian lock and canal	---	---	5,000,000
Total locks and canal	29,940,709	2,477,313	37,418,022
St. Marys River improvements	---	---	18,329,112
St. Marys River maintenance	---	---	2,203,067
Grand Total			57,950,201

OPERATION, MAINTENANCE, AND FREIGHT-TON COSTS, ST. MARYS FALLS CANAL

Year	Improvement and recon-struction	Operating	Repairs	Total operating and repairs	Cost per freight-ton (mills)
1941	$25,314.63	$213,351.36	$110,345.77	$323,697.13	2.99
1942	399,520.94	252,513.03	114,840.77	367,353.80	3.14
1943	681,422.97	297,293.25	175,388.55	472,681.80	4.25
1944	47,827.23	359,432.08	148,772.62	508,204.70	4.44
1945	454,215.69	417,242.50	275,688.14	692,930.64	6.23

(1) Actual cost to 30 June 1946: construction 97 per cent completed.

L A K E S U P E R I O R C O M M E R C E
1 8 5 5 - 1 9 4 5

The movement of freight to and from Lake Superior previous to the opening of the State Canal, in 1855, was by boat to Sault Ste. Marie, where the cargoes were unloaded, taken across the portage 1 mile long, and reloaded aboard boats.

In 1851 about 12,600 tons passed over the tramway portage; the transshipments to Lake Superior ports comprised the articles hay, oats, dry goods, groceries, and mining machinery to the value of $1,000,000 and those to lower lake ports included copper, iron blooms, and fish, valued at $675,000.

During the 91 years the canal has been in commission the yearly traffic has increased from a minimum of 14,503 tons in 1855 to 120,199,479 tons in 1942, the maximum record.

The tonnage for each decade since the canal has been in commission is as follows:

Years	Tons	Years	Tons
1855-64	1,203,358	1915-24	763,934,346
1865-74	4,829,247	1925-34	651,071,593
1875-84	14,868,639	1935-44	869,618,024
1885-94	80,343,218	1945-1 year	113,276,450
1895-1904	253,002,697		
1905-14	576,926,068	Total	3,329,073,640

HISTORICAL NOTES

The St. Marys Rapids is about 1/4 mile wide and 3/4 mile long. The fall of water ranges from 18 to 24 feet with the varying stages of water. The first canal was built on the Canadian side of the river by the Northwest Fur Company in 1797-98. The lock was 38 feet long, 8 feet 9 inches wide, with a lift of 9 feet. A towpath was made along the shores for oxen to track the bateaux and canoes through the upper part of the rapids. The lock, excepting its timber floor and miter sills, was destroyed in 1814 by United States troops from Mackinac Island under the command of Major Holmes. The first ship canal, known as the State Canal, was built on the American side of the river in 1853 to 1855; some 750,000 acres of land in Michigan having been granted by the United States Congress for the construction thereof. The canal was 1-1/12 miles long, 64 feet wide at the bottom, and 100 feet wide at the water surface. There were two tandem locks of masonry, each 350 feet long by 70 feet wide, with a lift of about 9 feet. The depth in the canal was about 13 feet and in the locks about 11-1/2 feet at the stage of water then prevailing. Captain A. Canfield, topographical engineer, United States Army, made the original surveys. Charles T. Harvey was superintendent of construction, and the St. Marys Falls Ship Canal Co. was the contractor. The locks were destroyed in 1888 by excavations for the present Poe Lock.

THE LOCKS AND CANALS

The Weitzel Lock, 515 feet long, 80 feet wide in chamber, narrowing to 60 feet at the gates, with 17 feet depth of water originally on the miter sills (11.2 feet at present low-water datum), was built by the United States in the years 1873 to 1881, and opened to traffic September 1, 1881. During the same period the canal was correspondingly deepened and was widened to 160 feet, and the stone slope walls were replaced with timber piers having a vertical face. Boyle & Roach were the principal contractors. The lock was destroyed in 1942 by excavations for the present MacArthur Lock.

The Canadian canal, 1-1/8 miles long, 150 feet wide, and 23 feet deep, with lock 900 feet long and 60 feet wide, originally having 22 feet of water on the miter sills (16.8 feet at present low-water datum), was built on the north side of the river in the years 1888 to 1895. Hon. Collingwood Schreiber was chief engineer of Dominion Canals, and W. G. McNeill Thompson was the Government engineer in local charge of construction work. Ryan & Haney were the contractors.

The Poe Lock, 704 feet long between inner gates, 100 feet wide, and originally having 22 feet of water on the sills (16.6 feet at present low-water datum), was built by the United States in the years 1887 to 1896. Hughes Bros. & Bangs were the principal contractors. The width of this lock was reduced to 95 feet by reinforcement of the south lock wall in 1943.

The Davis Lock, 1,350 feet long between inner gates, 80 feet wide, and originally have 24-1/2 feet of water on the miter sills (23.1 feet at present low-water datum), was built by the United States in the years 1908 to 1914, and opened to traffic October 21 of the latter year.

The Sabin Lock, of the same dimensions as the Davis Lock, was built by the United States in the years 1913 to 1919 and opened to traffic September 18, 1919.

The MacArthur Lock, 800 feet long between inner gates, 80 feet wide, and having 31.0 feet of water on the miter sills at present low-water datum, was built by the United States in the years 1942 to 1943 and opened to traffic July 11, 1943.

The canal (North Canal) leading to the Davis and Sabin Locks has a least depth of 23.1 feet. The canal (South Canal) leading to the MacArthur and Poe Locks has a least depth of 25 feet, except in the north draw at Bridge Island where the depth is 24.3 feet. The length between the upper and lower entrances is about 1-3/4 miles.

The present low-water planes are 601.1 feet, at the head, and 579.4 feet, at the foot of the locks, above mean tide at New York, levels of 1935.

IMPROVEMENTS

Improvements leading to the canal include those parts of the St. Marys River channels which have been dredged through shoals of sand, clay, boulders, sandstone, and limestone rock. The United States Government made the first appropriation for improving the river channels in 1856. The Lake George route was improved for 12 feet draft, 1857 to 1860 and 1867 to 1869. The depth was increased to 16 feet, 1879 to 1883. The Lake Nicolet route was improved for a depth of 20 feet at mean stage of water between the years 1882 and 1894. The Middle Neebish Channel was opened to commerce on June 7, 1894. Betterment of the channels has been continued since that time so that the dredged areas now total 45 miles in length, with least width of 300 feet of one-way traffic and 600 feet for two-way traffic increasing at angles and other critical places up to 1,500 feet.

In 1903 the excavation of the Middle and West Neebish Channels was begun for 21-foot depth. The West Neebish Channel was opened to commerce August 16, 1908, and the deepening of the Middle Neebish Channel was completed in 1912. During 1928-30 the Middle Neebish Channel was widened from 300 feet to 500 feet, with a minimum depth at present of 21 feet.

The West Neebish route was closed to traffic from April 24, 1931 to July 18, 1933 while the deepening of this channel was in progress. During this period the upbound and downbound traffic passed through the Middle Neebish route. The rock-cut section in the West Neebish route was deepened to 27 feet, the hard-bottom sections above and below the rock-cut section to 25 feet, and the soft-bottom courses

to 24 feet. Bayfield Channel from St. Marys Falls Canal to Little Rapids was deepened to 25 feet, and the courses from Little Rapids to Lake Nicolet were deepened to 24 feet during 1932-34. Lake Nicolet was deepened during 1932-33 to 25 feet for a width of 1,500 feet from Six Mile Point to the Upper Entrance Lights of the West Neebish Channel, a distance of 4 miles. Normally the downbound traffic uses the West Neebish Channel and the upbound traffic uses the Middle Neebish Channel. The channels through Round Island Middle Ground and Round Island Shoals Nos. 1 and 2 were improved during 1930-32 to a depth of 27 feet and a minimum width of 1,000 feet. The channel through Vidal Shoals was deepened to 26 feet in 1931-33.

The channel between Brush Point and Point Louise was improved in 1937 to a swept depth of 26 feet and a minimum width of 1,000 feet, so that all of the channels above the canal now have a least depth of 26 feet and a minimum width of 1,000 feet.

ENGINEER OFFICERS IN CHARGE

The Engineer Officers in charge of the river improvements were: Capt. A. W. Whipple, 1858-61; Col. T. J. Cram, 1866-70; Maj. O. M. Poe, 1870-73; Col. G. Weitzel, 1873-82; Maj. F. U. Farquhar, 1882-83; Col. O. M. Poe, 1883-95; Col. G. J. Lydecker, 1896-1902; Maj. W. H. Bixby, 1902-04; Col. Charles E. L. B. Davis, 1904-08; Col. C. McD. Townsend, 1908-12; Col. Mason M. Patrick, 1912-16; Col. Harry Burgess, 1916-17; Col. F. W. Alstaetter, 1917-18; Mr. L. C. Sabin was district engineer, 1918-19; Col. E. M. Markham, 1919-25; Lt. Col. E. J. Dent, 1925-28; Maj. D. McCoach, Jr., 1928-32; Lt. Col. R. C. Crawford, 1932-36; Col. V. L. Peterson, 1936-38; Col. C. R. Pettis, 1938-39; Major H. B. Pettit, 1939-40; Col. R. G. Barrows, 1940-43; Col. Paschal N. Strong, 1943; Col. Allison Miller, 1943-45.

GENERAL SUPERINTENDENTS

The general superintendents in charge of operating and care of the locks and canal and river improvements were; Alfred Noble, 1870-82; E. S. Wheeler, 1882-97; Joseph Ripley, 1897-1906; L. C. Sabin, 1906-25; Isaac De Young, 1925-40; Herman F. Rook, 1940-44; J. E. Harns, 1944-.

OPERATION OF LOCKS

Electricity generated by water power is used for operating all locks. An auxiliary diesel-electric power plant was installed in 1943 for emergency use. The American locks are filled in about 11 minutes, and the gates opened in 1-1/2 minutes.

Lockages of a single boat have been made through the MacArthur Lock in 10 minutes, through the Poe Lock in 10 minutes, through the Davis Lock in 13 minutes, and through the Sabin Lock in 11 minutes; but the average time spent in making a lockage last season was 29 minutes 59 seconds, this difference being due to the slow movement of large boats while entering and leaving the locks and to the fact that in 30% of the lockages more than one boat were passed.

The Canadian Lock can be operated in about 10 minutes. The average time of lockage through the Canadian Lock last season was 22 minutes 28 seconds.

From 1855 to 1881 the canal was controlled by the State of Michigan, and tolls charged to cover operating and repair expenses, the rate at first being 6-1/2 cents per registered ton, which was gradually reduced to 2-1/2 cents. Similarly, the minimum charge for lockage of a boat was reduced from $5 to $3. Since control was transferred to the United States in 1881 the American canal has been free for public use by all nations. Likewise, the Canadian canal has not collected tolls for passing either foreign or domestic commerce.

OPERATING AND MAINTENANCE FORCE

The lock force under State control consisted of about 20 men, having 1 watch only, as night navigation of the river was then impossible. Under United States control 2 watches of 12 hours each were established in 1881. The same continued until 1891 when 3 watches of 8 hours each were adopted. The force engaged in passing boats has been increased with the growth of commerce, the number now aggregating 173. In addition there are approximately 140 other persons employed as engineers, clerks, storekeepers, janitors, electricians, mechanics, and laborers.

SAULT STE. MARIE

1946

SCALE 1:20,000

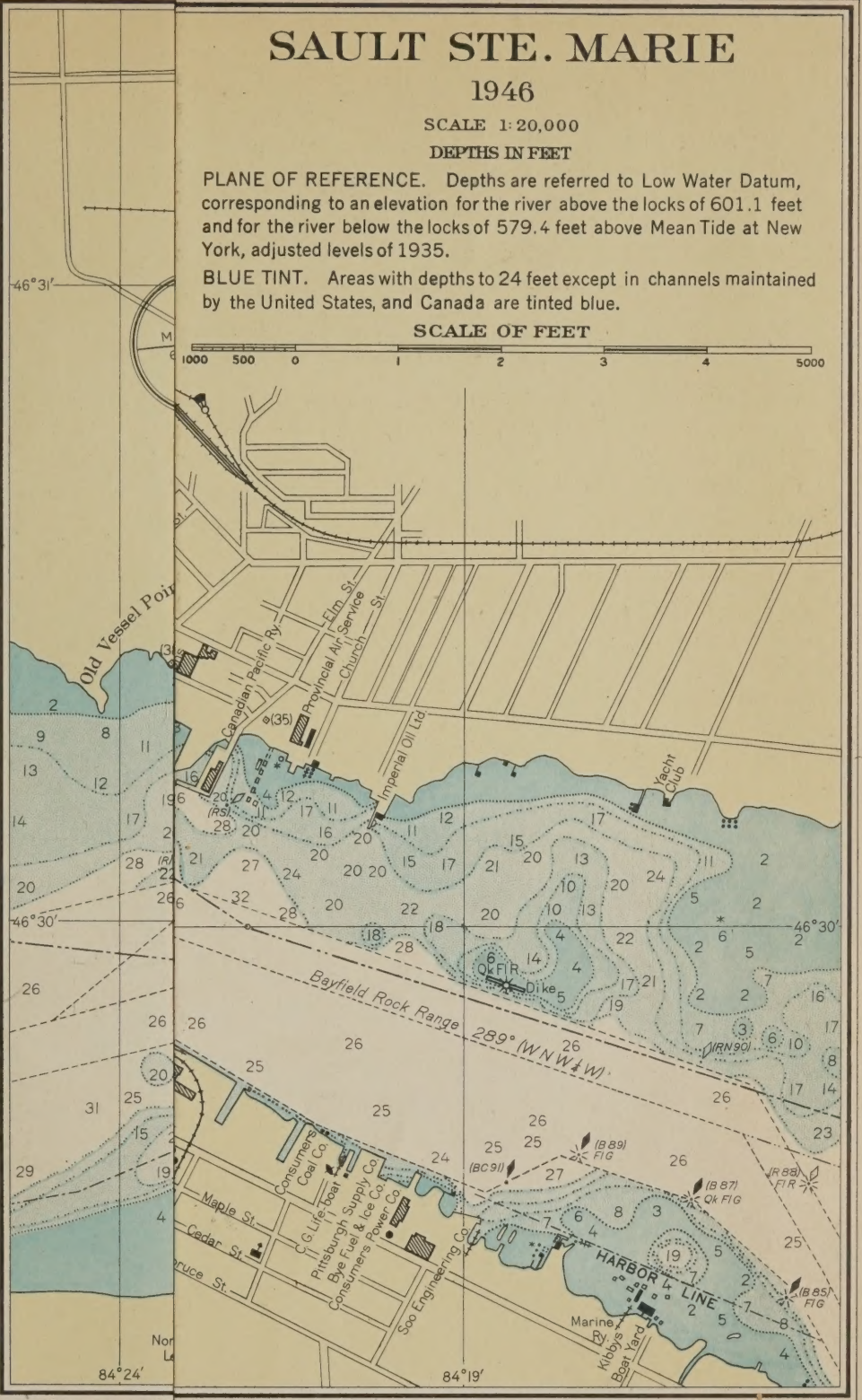
DEPTHS IN FEET

PLANE OF REFERENCE. Depths are referred to Low Water Datum, corresponding to an elevation for the river above the locks of 601.1 feet and for the river below the locks of 579.4 feet above Mean Tide at New York, adjusted levels of 1935.

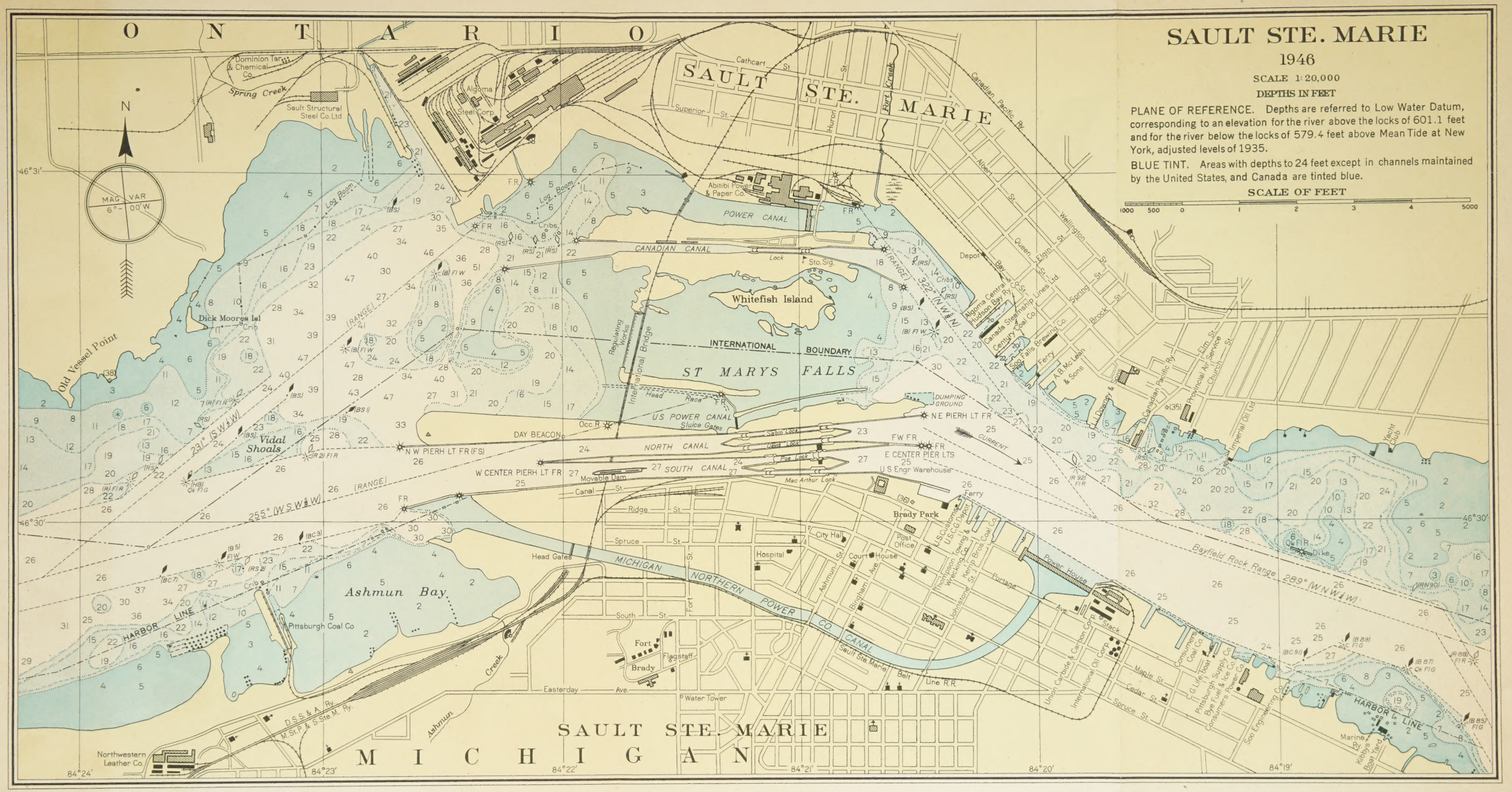
BLUE TINT. Areas with depths to 24 feet except in channels maintained by the United States, and Canada are tinted blue.

SCALE OF FEET

1000 500 0 1 2 3 4 5000



U.S. LAKE SURVE



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